

FIG. 1

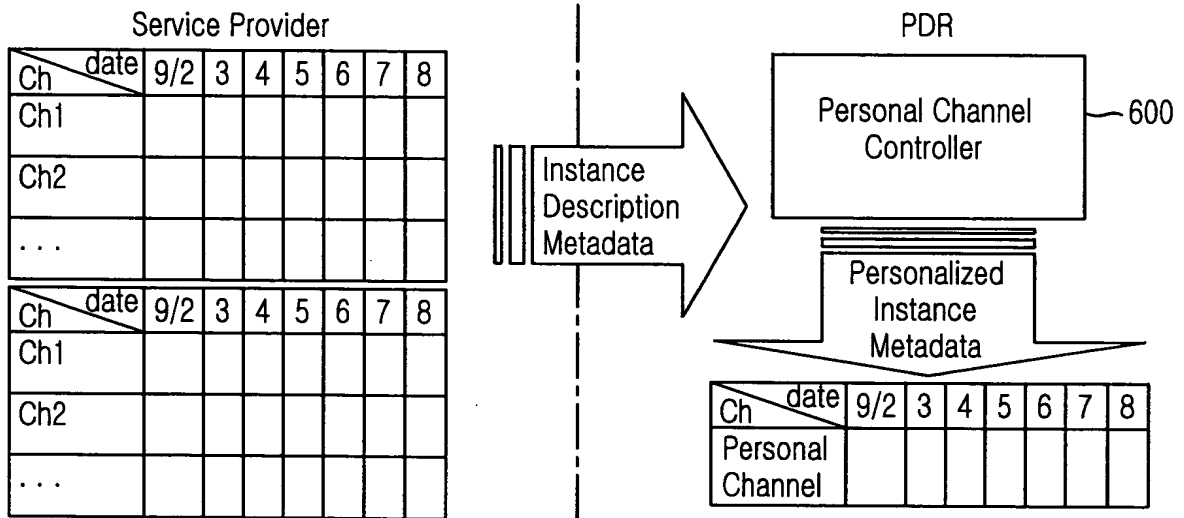


FIG. 2

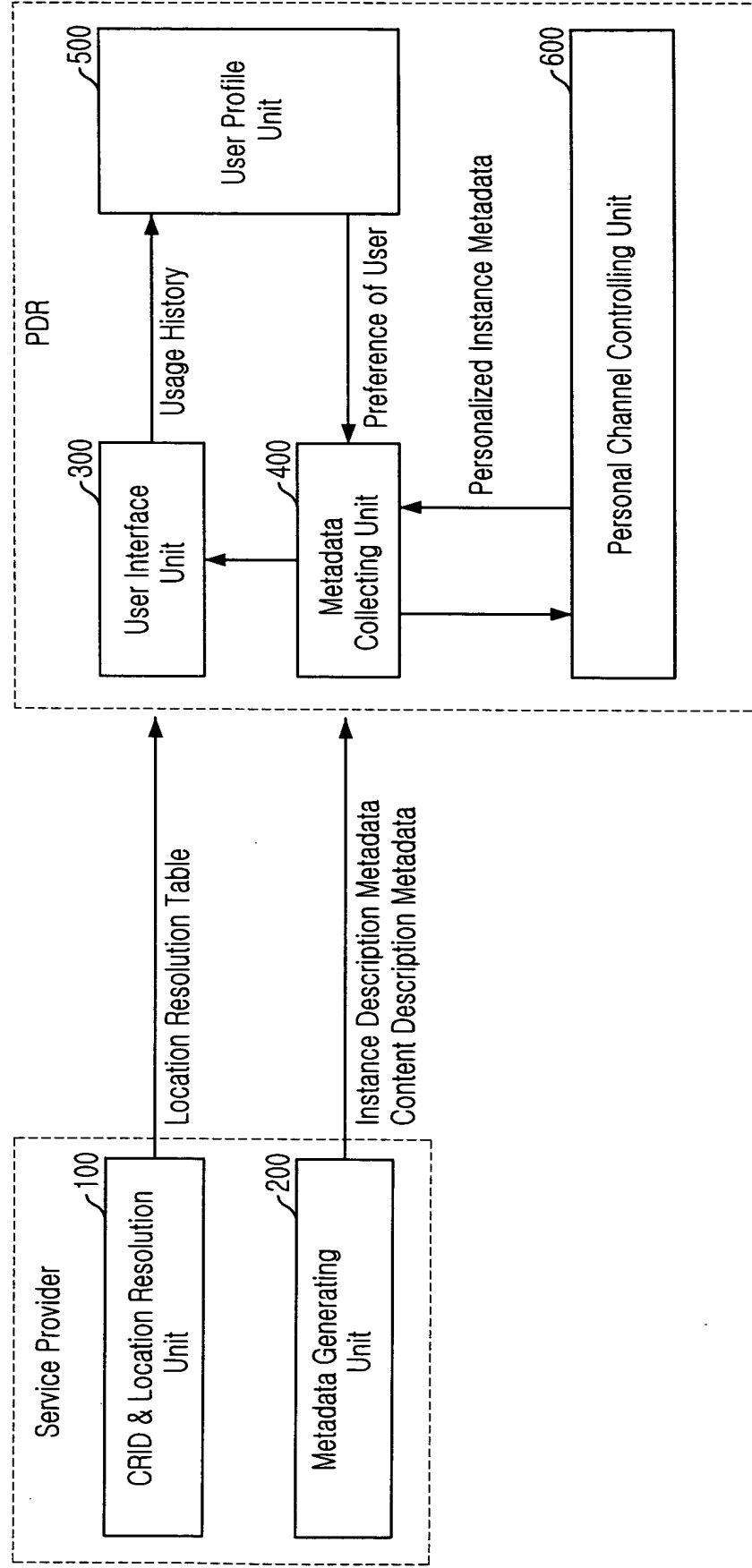


FIG. 3

```
<ProgramDescription>
  <ProgramInformationTable >
    <ProgramInformation programId="crid://imbc.com/sangdo/episode17">
      <BasicDescription>
        <Title> Sangdo_17 </Title>
        <Synopsis> The one where SangOk is embarrassed with the rumor
        </Synopsis>
        <Genre href="urn:mpeg:TVAnytime_v0.1ContentCS:2.1.1">
          <mpeg7:Name >Drama</mpeg7:Name>
        </Genre>
      </BasicDescription>
    </ProgramInformation>
    <ProgramInformation programId="crid://imbc.com/sangdo/episode18">
      <BasicDescription>
        <Title> Sangdo_18 </Title>
        <Synopsis> The one where SangOk sold his clothes cheaply
        </Synopsis>
        <Genre href="urn:mpeg:TVAnytime_v0.1ContentCS:2.1.1">
          <mpeg7:Name >Drama</mpeg7:Name>
        </Genre>
      </BasicDescription>
    </ProgramInformation>
  </ProgramInformationTable>
  <GroupInformationTable>
    <GroupInformation groupId="crid://imbc.com/sangdo/several"
      ordered="true" numOfItems="2">
      <GroupType xsi:type="ProgramGroupType" value="series"/>
      <BasicDescription>
        <Title>Sangdo</Title>
        <Synopsis>Several episodes of Sangdo</Synopsis>
        <Genre href="urn:mpeg:TVAnytime_v0.1ContentCS:2.1.1">
          <mpeg7:Name>Drama</mpeg7:Name>
        </Genre>
      </BasicDescription>
    </GroupInformation>
  </GroupInformationTable>
</ProgramDescription>
```

FIG. 4

```
<ProgramDescription>
  <ProgramLocationTable>
    <BroadcastEvent>
      <Program crid="crid://imbc.com/sangdo/episode17"/>
      <BroadcastURL>dvb://1.4ee2.3f4/</BroadcastURL>
      <EventDescription>
        <PublishedTime>2002-04-22T22:00:00</PublishedTime>
        <PublishedDuration>PT50M</PublishedDuration>
      </EventDescription>
      <ServiceId id="Ch1"/>
    </BroadcastEvent>
    <BroadcastEvent>
      <Program crid="crid://imbc.com/sangdo/episode18"/>
      <BroadcastURL>dvb://1.4ee2.3f4/</BroadcastURL>
      <EventDescription>
        <PublishedTime>2002-04-23T22:00:00.00</PublishedTime>
        <PublishedDuration>PT50M</PublishedDuration>
      </EventDescription>
      <ServiceId id="Ch1"/>
    </BroadcastEvent>
  </ProgramLocationTable>
  <ServiceInformationTable>
    <ServiceInformation serviceId="Ch1">
      <Name>MBC</Name>
      <Owner>MBC</Owner>
    </ServiceInformation>
  </ServiceInformationTable>
</ProgramDescription>
```

FIG. 5

```
<UserDescription>
  <UserPreferences>
    <mpeg7:UserIdentifier>
      <mpeg7:Name xml:lang="en">etri</mpeg7:Name>
    </mpeg7:UserIdentifier>
    <mpeg7:FilteringAndSearchPreferences>
      <mpeg7:CreationPreferences>
        <mpeg7:Title preferenceValue="99">sangdo</mpeg7:Title>
      </mpeg7:CreationPreferences>
    </mpeg7:FilteringAndSearchPreferences>
    <mpeg7:FilteringAndSearchPreferences>
      <mpeg7:ClassificationPreferences>
        <mpeg7:Genre href="urn:mpeg:mpeg7:cs:GenreCS:2001:2.1.1"
          preferenceValue="80">
          <mpeg7:Name>Drama</mpeg7:Name>
        </mpeg7:Genre>
      </mpeg7:ClassificationPreferences>
      <mpeg7:PreferenceCondition>
        <mpeg7:Time recurrence="weekly">
          <mpeg7:TimePoint>2002-04-23T11:00</mpeg7:TimePoint>
          <mpeg7:Duration>PT1H</mpeg7:Duration>
        </mpeg7:Time>
      </mpeg7:PreferenceCondition>
    </mpeg7:FilteringAndSearchPreferences>
  </UserPreferences>
</UserDescription>
```

FIG. 6

```
<ProgramDescription>
  <ProgramLocationTable>
    <BroadcastEvent>
      <Program crid="crid://imbc.com/sangdo/episode18"/>
      <BroadcastURL>dvb://1.4ee2.3f4/</BroadcastURL>
      <EventDescription>
        <PublishedTime>2002-04-16T22:00:00.00</PublishedTime>
        <PublishedDuration>PT50M</PublishedDuration>
      </EventDescription>
      <ServiceId id="Ch1" />
    </BroadcastEvent>
    <BroadcastEvent>
      <Program crid="crid://imbc.com/sangdo/episode18"/>
      <BroadcastURL> My_PDR/personal/</BroadcastURL>
      <EventDescription>
        <PublishedTime>2002-04-20T11:00:00.00</PublishedTime>
        <PublishedDuration>PT50H</PublishedDuration>
      </EventDescription>
      <ServiceId id="Ch2" />
    </BroadcastEvent>
  </ProgramLocationTable>
  <ServiceInformationTable>
    <ServiceInformation serviceId="Ch1">
      <Name>MBC</Name>
      <Owner>MBC</Owner>
    </ServiceInformation>
    <ServiceInformation serviceId="Ch2">
      <Name> PERSONAL </Name>
      <Owner>My_PDR</Owner>
    </ServiceInformation>
  </ServiceInformationTable>
</ProgramDescription>
```

FIG. 7

```
<UserDescription>
  <UsageHistory id="usage-history-001" allowCollection="true">
    <mpeg7:UserIdentifier protected="true">
      <mpeg7:Name xml:lang="en">etri</mpeg7:Name>
    </mpeg7:UserIdentifier>
    <mpeg7:UserActionHistory protection="false">
      <mpeg7:ObservationPeriod>
        <mpeg7:TimePoint>2002-04-18T10:00</mpeg7:TimePoint>
        <mpeg7:Duration>PT3H</mpeg7:Duration>
      </mpeg7:ObservationPeriod>
      <mpeg7:UserActionList id="ua-list-001"
        numInstances="1" totalDuration="PT20M">
        <mpeg7:ActionType href="urn:mpeg:mpeg7:cs:ActionTypeCS:2001:3.4">
          <mpeg7:Name>ViewGuide</mpeg7:Name>
        </mpeg7:ActionType>
        <mpeg7:UserAction>
          <mpeg7:ActionTime>
            <mpeg7:MediaTime>
              <mpeg7:MediaTimePoint>
                2002-04-18T10:05:00
              </mpeg7:MediaTimePoint>
              <mpeg7:MediaDuration>PT00H20M
            </mpeg7:MediaDuration>
            </mpeg7:MediaTime>
          </mpeg7:ActionTime>
          <mpeg7:ProgramIdentifier organization="TVAF" type="CRID">
            crid://imbc.com/sangdo/several
          </mpeg7:ProgramIdentifier>
        </mpeg7:UserAction>
      </mpeg7:UserActionList>
    </mpeg7:UserActionHistory>
  </UsageHistory>
</UserDescription>
```

FIG. 8

```
<ContentReferencingTable>
  <Result CRID="crid://imbc.com/sangdo/episode18" status="resolved" complete="true"   acquire="any">
    <LocationsResult>
      <Locator>
        dvb://1.4ee2.3f4:4f5@2002-04-16T22:00:00.00/PT00H50M
      </Locator>
      <Locator>
        My_PDR/personal/sangdo18@2002-04-20T11:00:00.00/PT00H50M
      </Locator>
    </LocationsResult>
  </Result>
</ContentReferencingTable>
```


FIG. 9

SQL Server Enterprise Manager - [2:Data of 'Usage History' Table('TVConsumerMetadata'Database, 'LHK95'Computer)]													
Console(C) Window(W) Help(H)													
User Identifier	Observed Date	Observed Duration	numC	Total Duration	Action Type Nam	Action Type ID	Program ID	Action	Brow Query	Action Media Date	Action Media Dur	Action General Date	
User 1	2002-08-27 pm 56	0	0	0	Search	3.7			0	Sangdo	1970-01-01 am 9:00 0	2002-08-27 pm 5:02:48	
User 1	2002-08-27 pm 56	0	0	0	PlayRecording	1.1	crtd://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00 9	2002-08-27 pm 5:02:45	
User 1	2002-08-27 pm 57	0	0	0	Search	3.7			0	Sangdo	1970-01-01 am 9:00 0	2002-08-27 pm 5:07:08	
User 1	2002-08-27 pm 57	0	0	0	PlayRecording	1.1	crtd://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00 12	2002-08-27 pm 5:07:01	
User 1	2002-08-27 pm 56	0	0	0	Search	3.7			0	QUESTION	1970-01-01 am 9:00 0	2002-08-27 pm 5:09:19	
User 1	2002-08-27 pm 56	0	0	0	Search	3.7			0	QUERY	1970-01-01 am 9:00 0	2002-08-27 pm 5:09:29	
User 1	2002-08-27 pm 56	0	0	0	Search	3.7			0	EVENT	1970-01-01 am 9:00 0	2002-08-27 pm 5:09:34	
User 1	2002-08-27 pm 56	0	0	0	Search	3.7			0	DESCRIPTION	1970-01-01 am 9:00 0	2002-08-27 pm 5:09:43	
User 1	2002-08-27 pm 56	0	0	0	PlayRecording	1.1	crtd://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00 34	2002-08-27 pm 5:09:13	
User 1	2002-08-27 pm 57	0	0	0	Search	3.7			0	Kim, Gu-Sun	1970-01-01 am 9:00 0	2002-08-27 pm 5:13:01	
User 1	2002-08-27 pm 57	0	0	0	PlayRecording	1.1	crtd://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00 12	2002-08-27 pm 5:12:53	
User 1	2002-08-27 pm 56	0	0	0	Search	3.7			0	Kim, So-Wol	1970-01-01 am 9:00 0	2002-08-27 pm 5:16:02	
User 1	2002-08-27 pm 56	0	0	0	PlayRecording	1.1	crtd://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00 13	2002-08-27 pm 5:15:53	
User 1	2002-08-27 pm 56	0	0	0	Search	3.7			0	Kim, So-Wol	1970-01-01 am 9:00 0	2002-08-27 pm 5:38:15	
User 1	2002-08-27 pm 56	0	0	0	PlayRecording	1.1	crtd://www.kbs1.co.kr/language200100385		1		1970-01-01 am 9:00 10	2002-08-27 pm 5:38:11	
User 1	2002-08-27 pm 56	0	0	0	Search	3.7			0	Kim, So-Wol	1970-01-01 am 9:00 0	2002-08-27 pm 5:40:04	
User 1	2002-08-27 pm 56	0	0	0	PlayRecording	1.1	crtd://www.kbs1.co.kr/novel200100389		1		1970-01-01 am 9:00 1	2002-08-27 pm 7:13:39	
User 1	2002-08-28 am 56	0	0	0	PlayRecording	1.1	crtd://www.kbs2.co.kr/dongsuh200100444		1		1970-01-01 am 9:00 1	2002-08-28 am 9:12:56	
User 1	2002-08-27 pm 56	0	0	0	ViewGuide	3.4	crtd://www.imbc.com/lover200100752		0		1970-01-01 am 9:00 0	2002-08-27 pm 7:14:03	

FIG. 10

Date Preference DB

User ID	Date	Preference Value	Real Time	Stored	User ID	Date	Preference Value	Watched Duration
Hong, Gil-Dong	SUN 00	88	3	2	Hong, Gil-Dong	SUN 00	DRAMA	40
	SUN 01	22					NEWS	20
							SPORTS	0
						SUN 01		
	MON 00	22				MON 00	90	
	MON 01	-10				MON 01	50	
	MON 02					MON 02		

FIG. 11

Filtering & Search Preference Table

Field	Type of Data	Example
User Identifier	Textual Type	Hong, Gil-Dong
Preference Value	Integer	-100~+100
Title	Textual Type	Sangdo: Life of Ginseng Merchant
Genre	Textual Type	DRAMA
Genre ID	Genre-Classification-Number	2.1.1
Preferred Date	Textual Type	2002-04-15 MON pm 11:00:00
Preferred Duration	Unsigned Integer	60(Minute)

FIG. 12A


ETRI 2002-01-17		Program information		
		<p>Everyday with You -34th Episode-</p> <p>Story of two women having closely located houses of family-in-law but emotionally far</p> <p>Genre: Drama</p>		
		<div><div><input type="radio"/></div><div><input type="radio"/></div><div><input type="radio"/></div><div><input type="radio"/></div><div><input type="radio"/></div></div>		
Channel	Broadcasting Station	Time	Title of Program	Save
2	KBS2	20:25-20:55	This Is Love -39th-	<input type="radio"/>
4	SBS	20:20-20:55	Everyday With You -34th-	<input type="radio"/>
4	SBS	20:55-21:50	MBC News Desk	<input type="radio"/>
5	EBS	20:40-20:45	Sports of Today	<input type="radio"/>

FIG. 12B


ETRI 2002-01-17		Group information	
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p>Sangdo: Life of Ginseng Merchant</p> <p>This drama shows what a real entrepreneur should be like and what economic justice is</p> <p>Genre: Drama</p> </div> <div style="text-align: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">7</div> </div> </div>			
Channel	Broadcasting Station	TIME	Title of Program
3	MBC	22:05-23:05	Sangdo -17th-
3	MBC	22:05-23:05	Sangdo -18th-
3	MBC	22:05-23:05	Sangdo -19th-
3	MBC	22:05-23:05	Sangdo -20th-
Save			

FIG. 13

Syntax	Definition
Series	A set of programs having a word order (e.g., hourglass) or having no word order (e.g., Tom & Jerry). If a program does not have a predetermined number of broadcasting (e.g., Amateur Singing Contest), the program is regarded as series
Show	Entire themes of series (e.g., all subjects and titles of Tom & Jerry)
Program Concept	Concept of editor on characteristics, versions and generation of a program
Magazine	A group of sub-programs for each event, e.g., sports
Program Compilation	A set of segments from many programs
Other Collection	An arbitrary group other than defined list. When a group is selected, all programs of the group are acquired
Other Choice	An arbitrary group other than defined list. When a group is selected, one program of the group is acquired

FIG. 14

Genre	Group Type	Option	Example	Notes
Drama	Series	Ordered	crid://www.sbs.co.kr/womanwide	Drama with identical title
News	Series	Ordered by Publication Date	crid://www.imbc.com/newsdesk	News with identical title
Sports	Series	Ordered by Publication Date	crid://www.imbc.com/sportsnews	Sub-programs exist within a sports program => sub-programs of series are not independent from each other
	Magazine	Ordered by Publication Date	crid://www.imbc.com/sportsnews	
Documentary	Series	Ordered by Publication Date	crid://www.kbs1.co.kr/beautykorea	Documentary program with identical title
Education	Series	Ordered by Publication Date	crid://www.ebs.co.kr/dingdong	Education program with identical title
Science	Series	Ordered by Publication Date	crid://www.ebs.co.kr/science	Science program with identical title
Music	Series	Ordered by Publication Date	crid://www.kbs2.co.kr/singstar	Music Program With Identical Title
Entertainments	Series	Ordered by Publication Date	crid://www.imbc.com/comedyhuse	Entertainment program with identical title
Show	Series	Ordered by Publication Date	crid://www.sbs.co.kr/morningwide	Show program with identical title

FIG. 15

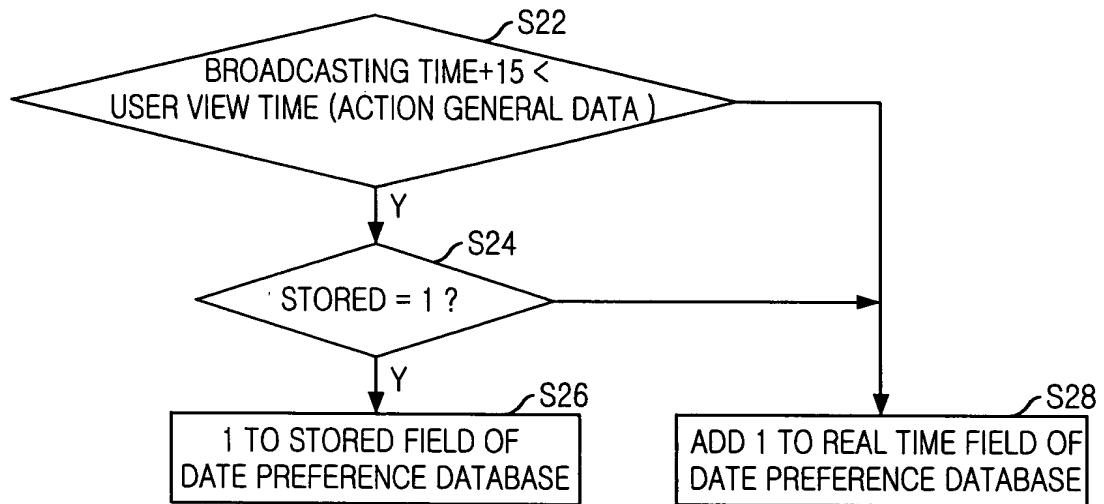


FIG. 16

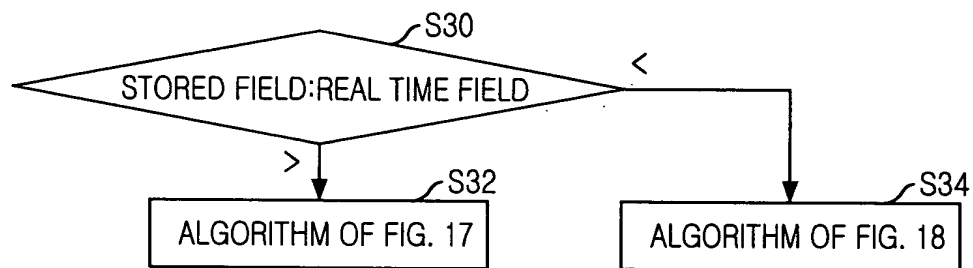


FIG. 17

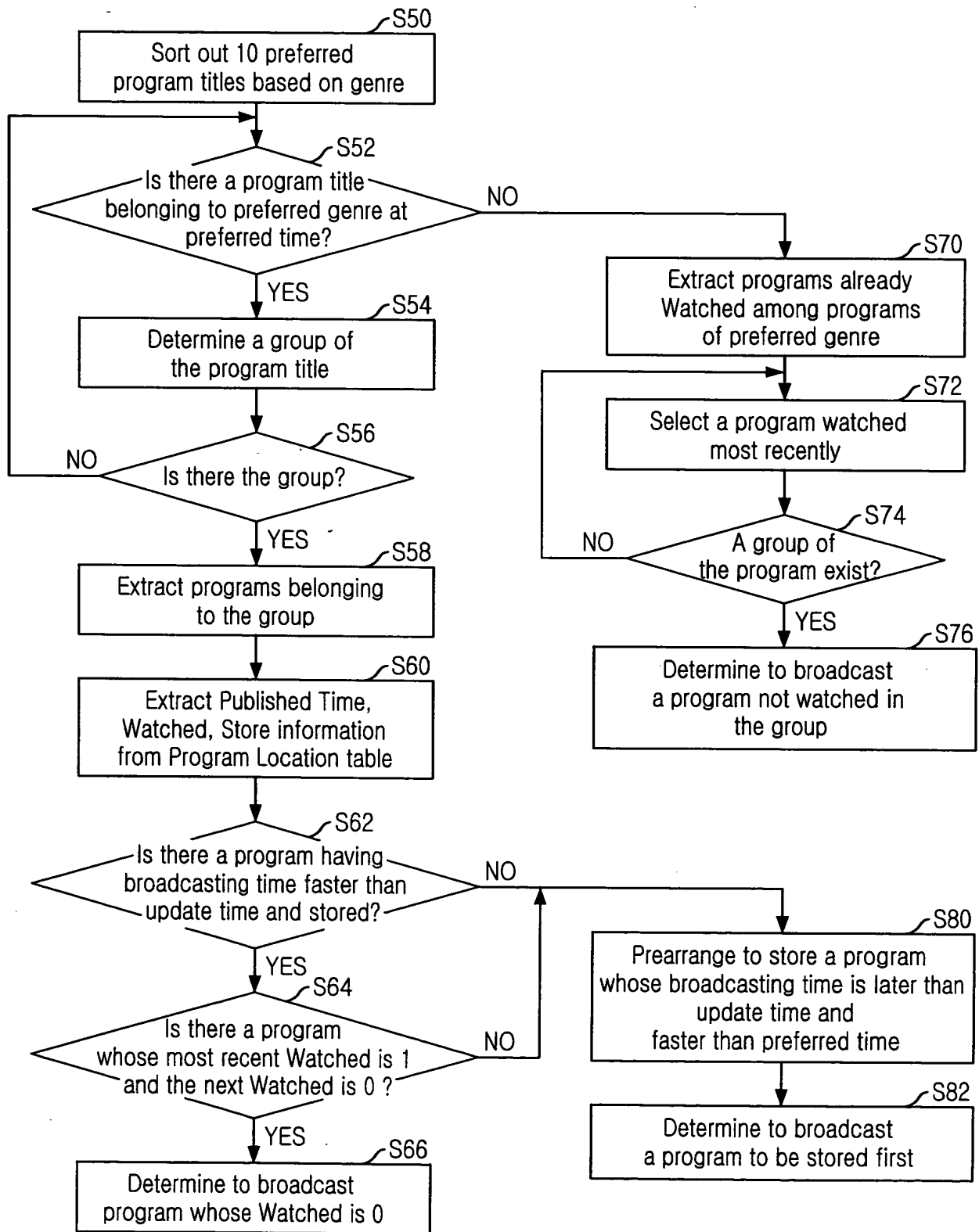


FIG. 18

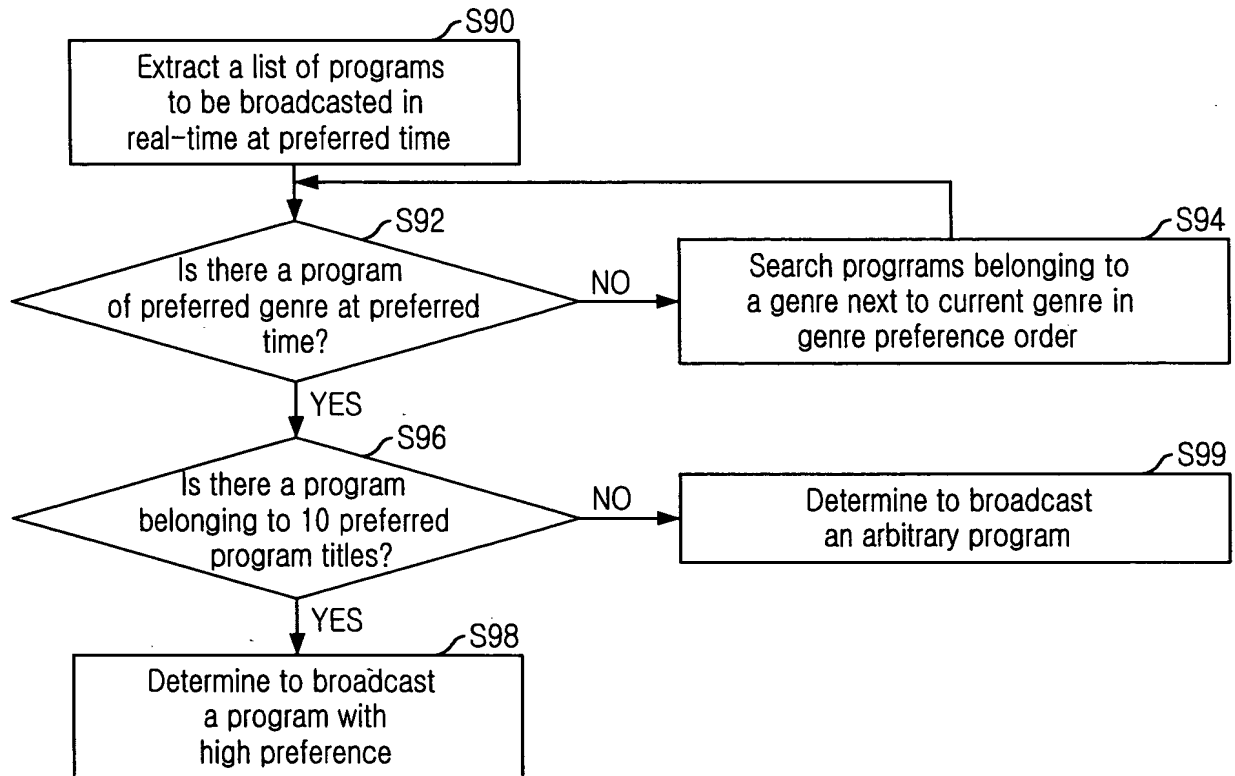


FIG. 19

VALUE	MEANING
0	NOT WATCHED
1	WATCHED

FIG. 20

VALUE	MEANING
0	SUNDAY
1	MONDAY
2	TUESDAY
3	WEDNESDAY
4	THURSDAY
5	FRIDAY
6	SATURDAY

FIG. 21

VALUE	MEANING
0	NOT STORED
1	STORED

FIG. 22

Service ID	Valid Time	Valid Period	Name	Owner	Logo
2	2001-11-08 10:00	2880	KBS1	KBS	Logo
3	2001-11-09 15:00	2880	KBS2	KBS	Logo
4	2001-11-10 18:00	2800	MBC	MBC	Logo
5	2001-11-15 09:00	2800	SBS	SBS	Logo
6	2001-11-14 12:00	2880	EBS	EBS	Logo
7	2001-11-12 10:00	2880	PERSONAL	MY_PDR	Logo

FIG. 23

Program ID	Version	Title	Synopsis	Published Time	Published Duration	Live	Repeat	First Showing	Last Showing	PPV	URL	Service ID	Day	Store	Watched
crid://www.sbs.co.kr/womanworld18	16	Women World -90th-	Born as a daughter of a mistress~	2000-08-16 pm 08:00	60	0	0	0	0	0	crid://www.sbs.co.kr	1 (Personal)	6 (Saturday)	1	0
crid://www.sbs.co.kr/womanworld18	16	Women World -90th-	Born as a daughter of a mistress~	2000-08-15 pm 11:00	60	0	0	0	0	0	crid://my_PDR/personal	5	5 (Friday)	1	0